

<b>Audit Report</b>	: Performance Audit Report on 'Provision of Drinking Water in Thimphu Municipality' (AIN 14732)
<b>Schedule of Audit</b>	: 1st March 2017 – 10th May 2017
<b>Date of Issue</b>	: 14th August 2017
<b>Period covered by Audit</b>	: 2010 to 2016
<b>Name of Agency</b>	: Thimphu Thromde, Royal Centre for Disease Control (RCDC), Ministry of Health (MoH), Ministry of Works and Human Settlement (MoWHS) and National Environment Commission Secretariat (NECS)
<b>No. of Review</b>	: 2 <sup>nd</sup> Review

Recommendations		RAA's Last Comments	Action Taken Submitted by Thimphu Thromde	RAA's Further Comments
<b>4.1</b>	<p><b>Thimphu Thromde should provide reliable and equitable water supply to its population</b></p> <p>Analyzing the water received in each zone of Thimphu Municipality as against the required amount, it was noted that the zones received varying amount of drinking water ranging from 28% to 94% of the requirement depicting inequity in water supply. Further, some areas do not have Thromde's water connection at all despite having enough water produced to meet the required amount of water.</p>	<p><b>Partially Implemented</b></p> <p>While the RAA is appreciative of the various actions taken by the management through the construction of water tanks it is to reiterate that there is still a need to have a strategic plan to provide reliable and equitable water supply.</p> <p>The RAA has noted that various water supply tanks are being constructed to provide reliable and equitable water supply to its population. However, with regard to some areas that do not have Thromde's water connection at all despite having enough water produced to meet the required amount of water, nothing has been intimated on the action taken on this matter. And at the same</p>	<p>No further action taken report submitted after RAA's last comments.</p>	<p>The RAA has written a letter to Thimphu Thromde seeking Action Taken Report for the unresolved audit recommendations reported in Review Report 2018 on 03/09/2018 and a reminder letter for the same was also issued on 28/09/2018. Despite repeated follow ups by the RAA, the Thimphu Thromde failed to submit the Action Taken Report for the unresolved audit recommendations reported in the review report 2018.</p>

	<p>The RAA also noted inadequate storage capacity of service tanks leading to water shortages in certain areas. Strategic water distribution plan considering the size and density of population, area and different user groups to ascertain the amount of water supply required for each zone in order to ensure reliable and equitable drinking water. Thromde should also construct adequate numbers of service tanks proportionate to water requirement.</p>	<p>time to ensure reliable and equitable drinking water considering the size and density of population, area and different user groups to ascertain the amount of water supply required for each zone, nothing has been mentioned in the reply to RAA.</p> <p>While the recommendation is also to have adequate number of service tanks, it is partially also to formulate a strategic water distribution plan. Therefore, para has been treated as partially implemented since a thorough study still needs to be carried out to have equitable and reliable water supply.</p>		<p>Therefore, the status of the recommendations remains the same as been reported in the 1<sup>st</sup> review report of 2018.</p>
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<p><b>4.2</b></p>	<p><b>Thimphu Thromde should establish a robust system to monitor and supervise the water distribution network</b></p> <p>Absence of monitoring system for water sources and the distribution network has led to huge loss of water, water revenue and interruption in water supply. To ensure quality and reliable supply of drinking water and also to control water loss in the water distribution network, there should be robust monitoring system established for water distribution networks. The Thromde should come up with components of monitoring system such as monitoring standards and protocol, formation of monitoring team, schedule and reporting, etc. to have established system in place.</p>	<p><b>Partially Implemented</b></p> <p>The RAA noted that works are already under progress through a diagnostic study to ensure established monitoring system in place including monitoring standards and protocol, formation of monitoring team, schedule and reporting, etc.</p> <p>The recommendation shall be treated as partially implemented until the aforementioned study is completed and measures appropriately implemented in relation to the monitoring and supervision of the water distribution network.</p>	<p>-do-</p>	<p>-do-</p>
<p><b>4.3</b></p>	<p><b>Thimphu Thromde should maintain and safeguard water distribution network</b></p> <p>Several inadequacies were noted in the water distribution network relating to infrastructure and water protection</p>	<p><b>Partially Implemented</b></p> <p>It has been noted that geo-coordinated network data of the water distribution system for use in GIS is being developed.</p> <p>The RAA has noted that the issue shall be addressed through the diagnostic study on</p>	<p>-do-</p>	<p>-do-</p>

	<p>such as inappropriate laying of water distribution pipes and Installation of water meters, improper fencing at water source and service tanks and non-functional bulk meters . In order to address the inadequacies noted, Thimphu Thromde should develop blueprint of water network system, conduct periodic maintenance of water distribution network infrastructure and develop guidelines on water meter installation.</p>	<p>Thromde Water services conducted by the World Bank. Since the issue has already been conceptualized and measures initiated to maintain and safeguard water distribution network the para shall be treated as partially implemented. However, the Thromde should intimate RAA until actual implementation is done.</p>		
<p><b>4.4</b></p>	<p><b>Irregularities noted in water network system should be corrected</b></p> <p>Instances of irregularities such as unauthorized tapping of water, water connection bypassing meters, water connection from transmission lines, allowing more than one connection per dwelling and diversion of water supply to community tanks were noted in the process of audit.</p> <p>Thimphu Thromde should further investigate and take appropriate action immediately. In addition, the Thromde</p>	<p><b>Not Implemented</b></p> <p>The RAA has noted that the customer service centre has initiated discussion to streamline the deficiencies by coming up with a separate rules and regulations specific to Thromde. However, the Thromde has not taken any appropriate actions on the irregularities noted in the report because Customer Service centre was already there in place. Therefore, proper action plan with document evidences are required in order to implement the recommendation.</p> <p>No substantial action has been taken to implement the recommendation.</p>	<p>-do-</p>	<p>-do-</p>

	<p>should also institute corrective measures in order to prevent such cases in the future.</p>	<p>Irregularities such as unauthorized tapping of water, water connection bypassing meters, water connection from transmission lines, allowing more than one connection per dwelling and diversion of water supply to community tanks needs to be corrected and intimated to RAA.</p> <p>Until Thimphu Thromde intimates RAA with proper implementation status, it shall remain as not implemented.</p>		
<p><b>4.5</b></p>	<p><b>Thimphu Thromde should develop comprehensive and accurate database on buildings and water meters</b></p> <p>Maintaining a comprehensive and up to date database on property holdings and issuance of water meters within the Municipality’s jurisdiction is very crucial for the Thromde to levy correct property taxes and water charges as mandated by law. Maintaining comprehensive and accurate database will not only help Thimphu Thromde to determine the actual number of water meters connected and those buildings that need to be connected. In</p>	<p><b>Partially Implemented</b></p> <p>The RAA has noted that the Thromde intends to address the issue through World Bank conducted diagnostic study on Thromde Water services.</p> <p>The RAA has noted that the Thromde has requested the World Bank to carry out diagnostic study on Thromde Water services.</p> <p>Comprehensive and accurate database on buildings and water meters are yet to be developed. Therefore, the recommendation shall remain partially implemented.</p>	<p>-do-</p>	<p>-do-</p>

	<p>addition, it will also help in assessing Thromde’s water coverage and proper accounting of water consumption and water revenue. This in turn would help the Thromde in effective planning and decision making in water supply management. Thus, Thimphu Thromde should develop comprehensive and accurate database on building and water meters.</p>			
<p><b>4.6</b></p>	<p><b>Thimphu Thromde should develop clear job roles and responsibilities for the officials working in Water Supply Section</b></p> <p>To ensure efficient and effective delivery of mandates of organization, divisions and sections should clearly understand their roles and responsibilities. There should be formal instructions for all units in the organization on how businesses are to be conducted. It shall be the collective responsibility of officials in the organization to facilitate achievement of Organizational goal.</p>	<p><b>Not Implemented</b></p> <p>Until Thimphu Thromde intimates RAA with proper implementation status, it shall remain as not implemented.</p> <p>Thimphu Thromde is yet to come up with clear job roles and responsibilities for the officials working in Water Supply Section.</p> <p>Therefore, the recommendation shall remain as not implemented.</p>	<p>-do-</p>	<p>-do-</p>

	<p>Thimphu Thromde should develop clear job roles and responsibilities for each position in Water Supply Section with accountability to address many inadequacies noted in this audit such as ineffective monitoring of the water network system, delay in providing water related services, inefficiency in addressing complaints, inadequacies in monitoring of water quality, etc.</p>			
<p><b>4.7</b></p>	<p><b>Water meter needs to be installed for every water connection provided by Thromde and accordingly charged.</b></p> <p>Thromde’s drinking water supplied to Babesa, Lungtenphu and Olakha from Megaypang water treatment plant since November 2014 was never charged. Furthermore, commercial car washing units did not have water meters installed despite having Thromde’s water supply. As a result, there was a loss of government revenue amounting to Nu. 20.37 million. Thimphu Thromde should ensure to install water meter for every</p>	<p><b>Partially Implemented</b></p> <p>Thimphu Thromde reported that water meters are installed and billings started in Babesa, Lungtenphu and Olakha areas and commercial car washing units.</p> <p>However, there were no justifications provided for the forgone government revenue of Nu. 20.37 million.</p> <p>Hence, RAA awaits justifications from Thimphu Thromde and accountability for the revenue forgone from the Thromde. Until then the recommendation shall remain partially implemented.</p>	<p>-do-</p>	<p>-do-</p>

	water connection provided and also justify for the forgone revenue.			
<b>4.8</b>	<p><b>Thimphu Thromde should provide adequate water supply in order to discontinue private and community connections</b></p> <p>The residents in Thimphu Thromde currently gets water supply from three sources viz. Thromde’s water supply, privately and community obtained water supply. Some residents just have one of the three water connections while the others have combination of two or all three of them. As per the Section 90 of the Water Regulation of Bhutan 2014, Thromde’s water supply should be the only source of potable water supply and all other water supply should be discontinued when Thromde supplies adequate water. Therefore, the Thromde should have plans to provide adequate water supply to all and eventually discontinue the private and community water supply connections.</p>	<p><b>Partially Implemented</b></p> <p>Thimphu Thromde has initiated to centralise the water sources and there are also plans to gradually discontinue usage of private and community connections by providing adequate water supply from Thromde.c. <i>Ensuring the quality of drinking water supply through enhanced coordination with RCDC which include taking prompt actions to remedy and minimize the risk and hazards associated with contamination of water supplies.</i></p> <p>Since the work are initiated and still under process, the recommendation shall remain as partially implemented. Thimphu Thromde should complete the works as assured and intimate RAA.</p>	-do-	-do-

	<p>Further, quality of drinking water from the private and community source are grossly polluted, thus the concerns for human health also warrants discontinuation.</p>			
<p><b>4.9</b></p>	<p><b>Coordination amongst the relevant agencies and authorities should be strengthened</b></p> <p>The Water Act of Bhutan 2011 envisions the holistic management of water resources requiring collaboration and cooperation of all key stakeholders for making informed decision on water and its development. The main agencies involved in provision of drinking water in Thimphu Municipality include Ministry of Works and Human Settlement (MoWHS), Ministry of Health (MoH), National Environment Commission Secretariat (NECS), and Thimphu Thromde. Recognizing the importance of effective coordination, National Environment Commission formed the National Water Resources</p>	<p><b>Not Implemented</b></p> <p>Until Thimphu Thromde intimates RAA with proper implementation status, it shall remain as not implemented.</p> <p>Action taken if any has not been intimated to RAA.</p>	<p>-do-</p>	<p>-do-</p>

	Board (NWRB) comprising of all the stakeholders. Since NWRB was inactive from 2014, the NECS should initiate to revive the NWRB and ensure they function as per the Water Regulation of Bhutan 2014.			
<b>4.10</b>	<p><b>The Ministry of Works and Human Settlement (MoWHS) should develop the master plan for drinking water supply</b></p> <p>As required by the Water Regulation of Bhutan 2014, the MoWHS should develop master plan for the national drinking water and wastewater management system for Thromde in consultation with local government in order to identify available options to ensure sufficient water for future generations. The plan would also provide clear strategic direction and holistic approach in the management of water supply system in the country.</p>	<p><b>Partially Implemented</b></p> <p>The audit follow up team on 28<sup>th</sup> March 2018 verified that a Draft Water Master Plan for Thimphu Thromde water supply was drafted by Thimphu Thormde in consultation with MoWHS.</p> <p>The para shall remain partially implemented until a comprehensive Water Master Plan is prepared, approved and the actions taken in accordance to the plans.</p>	-do-	-do-
<b>4.11</b>	<p><b>The National Environment Commission Secretariat (NECS) should finalize the Water Resources Inventory at the earliest</b></p>	<p><b>Not Implemented</b></p> <p>Action taken if any has not been intimated to RAA.</p>	-do-	-do-

	<p>Water Resources Inventory is the study carried out on the availability of water from different sources and its quality aspects. Having water resources inventory would help in providing information in proper allocation of water from various sources to meet the current and future water needs. Till the date of audit, the inventory on water resources conducted by the NECS was found to be in the draft form. Thus, the NECS should immediately finalize the Water Resources Inventory.</p>	<p>Until Thimphu Thromde intimates RAA with proper implementation status, the status shall remain as not implemented.</p>		
<p><b>4.12</b></p>	<p><b>Thimphu Thromde and the Royal Centre for Disease Control (RCDC) should ensure routine testing of the water quality</b></p> <p>The Thromde does not carry out the water quality tests on regular basis especially in the South Thimphu. Further, there was no test conducted for the private and community water supply by the Thromde, except for few tests in schools and institutes by Royal</p>	<p><b>Partially Implemented</b></p> <p>While water testing is conducted, there is a lack of systematic process for carrying out the testing, monitoring and reporting on water quality.</p> <p>Therefore, Thimphu Thromde should ensure compliance to Bhutan Drinking Water Quality Standard 2016 and Water Safety Plan.</p>	<p>-do-</p>	<p>-do-</p>

	<p>Centre for Disease Control (RCDC). Absence of regular testing could lead to provision of unsafe drinking water which in turn could trigger outbreak of water-borne diseases. Therefore, the Thromde and the RCDC should institute system to conduct water quality testing regularly as required by the WSP to ensure that the water supplied is safe at all times. Special attention should be given to test the water quality of schools, institutes and hospitals irrespective of the water supply source.</p>	<p>Until such actions are taken and status informed to RAA with documentary evidence, the recommendation shall be treated as partially implemented.</p>		
<p><b>4.13</b></p>	<p><b>Thimphu Thromde in collaboration with the Royal Centre for Disease Control (RCDC) should institute monitoring and reporting mechanism on water quality</b></p> <p>The report on the water quality tests conducted by technicians was neither monitored nor the result was submitted for review. Furthermore, there was no action taken on the test results despite showing high presence of faecal coliform and residual</p>	<p><b>Not Implemented</b></p> <p>The RAA has noted that the Bhutan Drinking Water Quality Standards 2016 will be implemented with effect from July 2017. However, Thimphu Thromde &amp; RCDC has not instituted monitoring and reporting mechanism on water quality.</p> <p>Thimphu Thromde &amp; Royal Centre for Disease Control (RCDC) has not instituted monitoring and reporting mechanism on water quality.</p>	<p>-do-</p>	<p>-do-</p>

	<p>chlorine. In absence of monitoring and reporting mechanism, appropriate treatment and timely actions cannot be taken if the water is contaminated.</p> <p>Therefore, Thromde in collaboration with RCDC should institute proper monitoring and reporting mechanism on water quality.</p>	<p>Hence, the recommendation shall remain as not implemented until Thimphu Thromde intimates RAA with proper implementation status.</p>		
<b>4.14</b>	<p><b>Thimphu Thromde should strengthen the storage facilities for water treatment chemicals</b></p> <p>It was observed there was lack of proper storage facilities for the chemicals used for water treatment, thereby deteriorating the chemical stability by exposing to direct sunlight. In some cases, it was also found stored at Caretakers' house posing risks to the families' of the caretakers. Therefore, Thimphu Thromde should have appropriate storage facilities for the chemicals.</p>	<p><b>Partially Implemented</b></p> <p>Storage facilities for chemicals were provided in many water treatment plants.</p> <p>However, few were found to be inadequate. Until such time the recommendation has been implemented and intimated to RAA, it shall remain as partially implemented.</p> <p>Thimphu Thromde has provided storage facilities for chemicals at Motithang, Jungshina and Chamgang water treatment plants.</p> <p>However, storage treatment plant at Dechencholing and reservoir tank at YHSS was found inadequate.</p>	-do-	-do-
<b>4.15</b>	<p><b>Thromde should ensure that expiry and manufactured dates are</b></p>	<p><b>Implemented</b></p>		

<p><b>labelled on the chemicals/ reagents and refrain from using expired chemicals</b></p> <p>It was observed that most disinfectants and chemicals used for water treatment and quality testing were not labelled with expiry and manufactured dates. In the case of Megaypang WTP, expired reagents were used for water quality testing. The expired reagents could lead to generation of wrong reports and it may not have the intended potency to affect the level of Contamination in the water. Therefore, the Thromde should ensure that the expiry and manufactured dates are labelled on the disinfectants and reagents and refrain from using expired reagents.</p>	<p>The RAA has noted that Thimphu Thromde will have a proper procedure to enhance the usage of chemicals and reagents for disinfection and testing of water quality.</p> <p>Therefore, the recommendation is treated as implemented and settled.</p>	<p>-do-</p>	<p>-do-</p>
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